May 7, 1963 H. G. LIEN ET AL 3,088,631

COMBINED SPOUT AND OPENER

Filed May 10, 1960 3 Sheets-Sheet 1

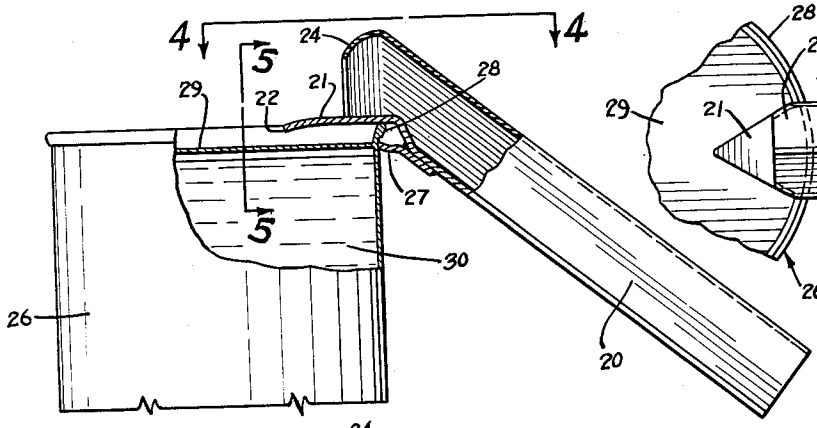


FIG. 1

FIG. 4

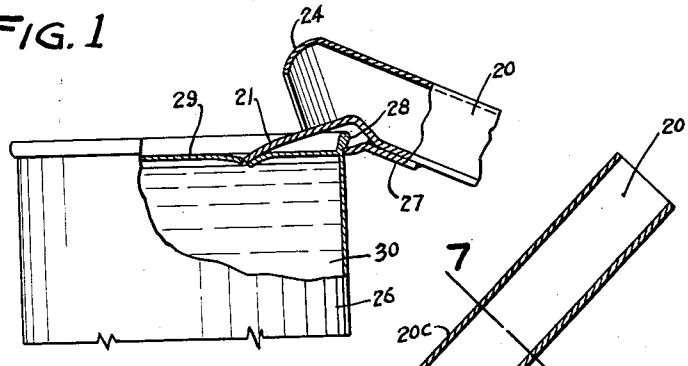


FIG. 2

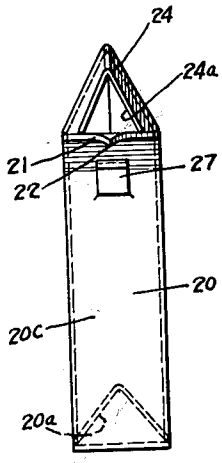


FIG. 5

FIG. 3

FIG. 6

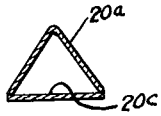


FIG. 7

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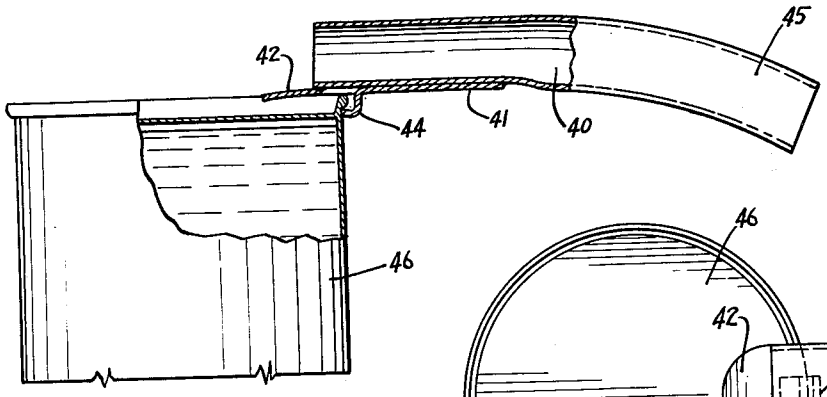


FIG. 8

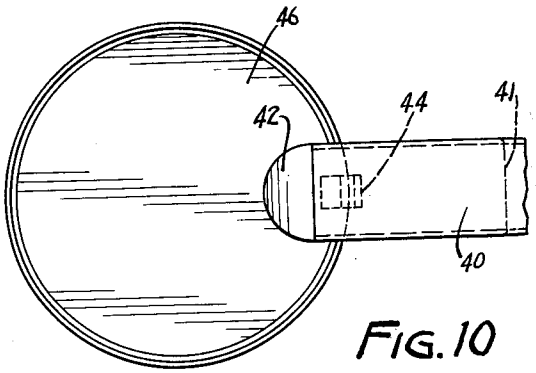


FIG. 10

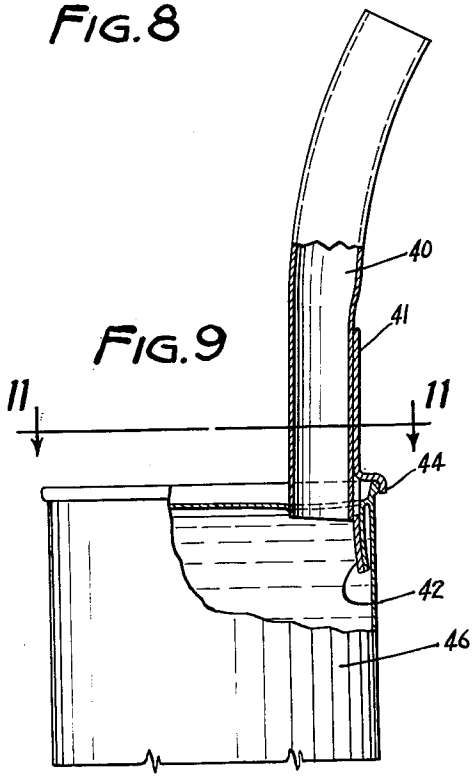


FIG. 9

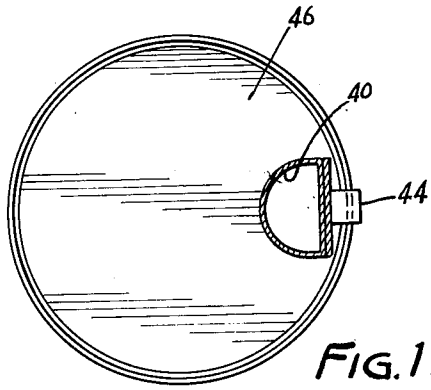


FIG. 11

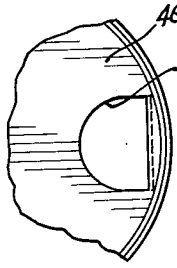


FIG. 12

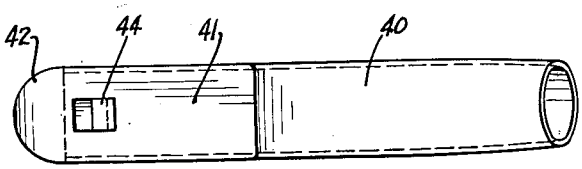


FIG. 13

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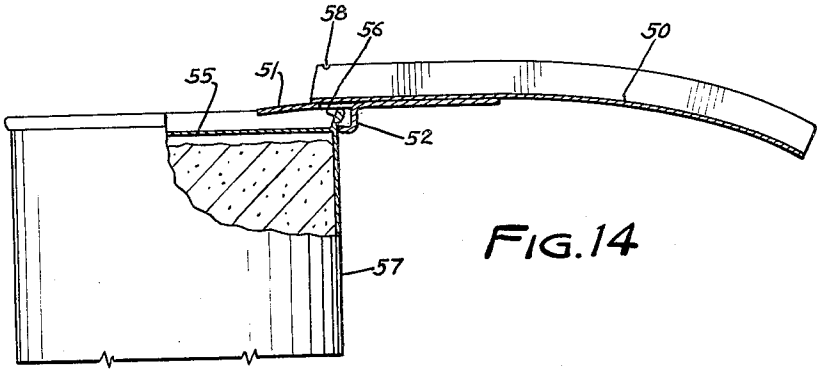


FIG. 14

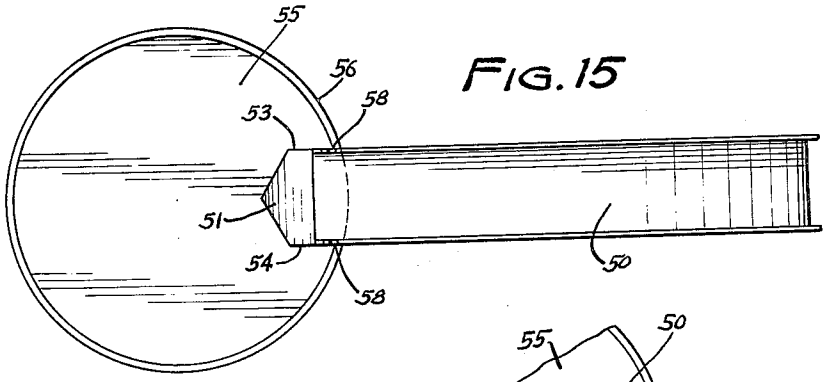


FIG. 15

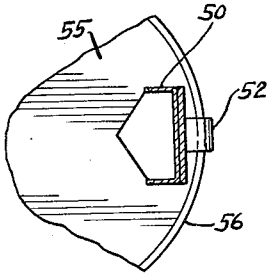


FIG. 17

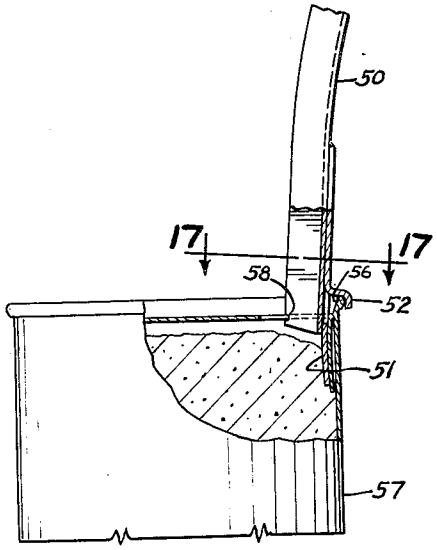


FIG. 16

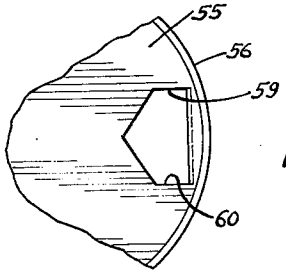


FIG. 18

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COMBINED SPOUT AND OPENER

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Filed May 10, 1960, Ser. No. 28,052
3 Claims. (Cl. 222—81)

This invention is a spout for containers. It includes a leverage type opener secured to a hollow tube so positioned with respect to each other that when a sealed receptacle is opened by piercing a portion of the surface of the receptacle with the leverage type opener, the tube automatically assumes a pouring position in relation to the contents of the receptacle or container.

Heretofore, sealed containers such as cans containing liquids to be poured, and particularly to be poured into narrow filler necks as is the case with motor oil for engines or anti-freeze into similar openings in radiator cores, have been made easier to use by means of spouts. The known spouts, however, have not been entirely satisfactory. One type of opener previously known may be called the straight thrust opener. There have been some variations of the straight thrust type opener, but in general it employs a sharpened point which, by brute force, is pushed into the can adjacent its rim. These openers usually include a spout that is secured to the cutter member. While such openers are widely used, they have certain drawbacks including among others the necessity of the application of substantial force at a point near the rim of the can while opening it. If the can is not held carefully, it is possible to overturn the can in the process of using the opener thereby spilling the contents resulting in unproductive use of time in cleaning up the spillage. Also such openers are often equipped with a portion that embraces the container being opened which limits seriously the variety of containers to which the opener can be applied and to only a single size to which the opener can be applied easily.

The other type opener widely used is one which has a cutter that is forced by leverage to puncture the container. It avoids the difficulties of the direct thrust opener, but provides no pouring spout. Hence the operator must exercise substantial skill when pouring the contents from a can so opened into a rather restricted opening such as the crank case filler neck of an automobile. Furthermore, a container that is merely punctured does not provide the type of a pouring lip that will cut off the flow of material cleanly when pouring is interrupted. This failure of the can lip to cut the flow of liquid cleanly is annoying if the entire content of the container is not to be discharged at one time.

Accordingly, the main purpose of this invention is to provide a pouring spout incorporating a leverage type container opener.

It is a further object of this invention to provide such leverage type opener with the spout attached that is automatically positioned for pouring as the sealed container is opened.

A still further object of this invention is to provide such a spout that is readily removed from the can once its function as a spout is completed.

Still a further object of this invention is to provide a pouring spout which provides an opening in a sealed container to pour through and then securely inserts a spout between the edges of the opening thus provided into a substantially leak proof arrangement.

A still further object of this invention is to provide a spout for sealed containers that will cut off the flow of material cleanly when pouring is interrupted.

It is another object of this invention to provide a spout that can be employed with a wide range of containers yet remains highly portable.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention is illustrated by the accompanying drawings in which the same numerals refer to corresponding parts and in which:

FIGURE 1 is a side elevation of a fragment of a can and the spout of the invention applied thereto; a portion of both the can and spout are broken away to illustrate their interaction more fully; broken lines shown hidden structure;

FIGURE 2 is a still more fragmentary view similar to FIGURE 1 showing the commencement of the opening action;

FIGURE 3 is a view similar to FIGURES 1 and 2 except that the entire opening action has occurred; broken lines illustrate hidden structure;

FIGURE 4 is a fragmentary plan view taken on the line 4—4 of FIGURE 1;

FIGURE 5 is an end elevation of the spout by itself viewed as shown by the line 5—5, FIGURE 1;

FIGURE 6 is a fragmentary plan view of a can top that has been punctured as a result of the use of the spout opener; broken lines showing hidden parts;

FIGURE 7 is a cross sectional view of the hollow tube taken on the line 7—7 of FIGURE 3;

FIGURE 8 is a view similar to the view in FIGURE 1 showing a modified form of the spout; broken lines illustrate hidden parts;

FIGURE 9 is a view similar to FIGURE 3 showing the modified form of the spout inserted in the container ready to pour; broken lines illustrate hidden parts;

FIGURE 10 is a fragmentary plan view of the structure shown in FIGURE 8 and similarly positioned;

FIGURE 11 is a horizontal section of the structure shown in FIGURE 9 and taken on line 11—11 in that figure; broken lines illustrate hidden parts;

FIGURE 12 is a view similar to FIGURE 6 only showing the opening formed by the alternate form of spout; broken lines illustrate hidden parts;

FIGURE 13 is a bottom plan view modified form spout in which broken lines illustrate hidden parts;

FIGURE 14 shows another form of spout in a view similar to FIGURES 1 and 8; portions of the can are broken away to illustrate the interaction of the spout and can more fully, and the spout is shown in longitudinal section;

FIGURE 15 is a plan view of the can and opener as shown in FIGURE 14 with broken lines showing hidden parts;

FIGURE 16 is a view of the second modification of the spout shown in the same position as the other forms of the spout are shown in FIGURES 3 and 9 fully engaged to the can ready to pour; broken lines show hidden parts.

FIGURE 17 is a horizontal section of the opener for the spout of FIGURE 14 and a fragment of the can top taken on the line 17—17 of FIGURE 16; and

FIGURE 18 is a plan view of the opening cut by the opener provided for the form of the invention illustrated in FIGURES 14–18.

Referring first to the form of the invention shown in FIGURE 1–7, and particularly to FIGURE 1, the invention is seen embodied in an elongated liquid guiding

member designated 20 to which is secured or has formed integrally therewith the cutter member 21 having a free end or point 22.

The elongated liquid guiding means 20 is advantageously made in the form of a tube that may be fabricated from a bottom portion 20*c*, which is formed integrally with cutter 21, and an angle member 20*a*. Thus a triangular tube is formed. As may be seen clearly in FIGURE 3, cutter 21 diverges from the longitudinal axes of tube 20 and requires a curved portion 24 to be provided at the cutter end of tube 20. As shown clearly in FIGURE 5, curved portion 24 commences with an opening 24*a* that is smaller than a cross section of tube 20. From this opening 24*a*, curved portion 24 gradually increases in size until it is identical in size and shape to the configuration and size of cutter 21 as it appears in FIGURE 4. Cutter 21, therefore, makes a triangular opening 25 in a can 26, as shown in FIGURE 6.

In opening a can and simultaneously affixing the spout thereto, the process is to engage the leverage hook or fulcrum member 27, secured to the member 20*c* of tube 20, with a leverage or fulcrum point such as a rim 28 of can 26. With the hook engaged to the rim of a can in this manner, the tube is raised to cause cutter 21 to first rupture the can top 29, as in FIGURE 2, and finally to position the spout in the can as shown in FIGURE 3. The edges of opening 25 frictionally embrace portion 24 of the spout to hold the spout on the can after the top surface 29 of can 26 has been opened by cutter 21.

As appears clearly in FIGURE 3 the spout thus affixed to can 26 provides liquid 30 with a means of egress from the can which aids materially in directing the flow of liquid as desired. For example, the spout will aid in directing the content of a can into a small opening.

If desired, can 26 may be provided with a vent opening at some point spaced from the point of mounting the spout by slightly puncturing lid 29 of can 26 as shown in FIGURE 2.

In FIGURES 8–13 the hollow tube 40 illustrated as having a straight portion to the exterior of which a separate cutter member 41 is secured. The cutter member includes a cutter element 42 and leverage member 44 integrally formed therewith. Cutter 42 extends substantially straight with respect to longitudinal axes of the straight portion of tube 40 and the end 45 of tube 40 is curved so as to provide a pouring spout directed away from the container to which the spout is connected. As shown in FIGURES 8 and 9 the pouring spout of the modified form is secured to a can 46 in substantially the same manner as the spout of FIGURES 1–7. Cutter 42 has a semi-circular configuration as shown in FIGURE 10, and as shown in FIGURE 11 the tube 40 has a identical size and configuration at least adjacent to cutter 42.

FIGURE 12 illustrates a semi-circular opening 47 formed in can 46 by cutter 42 into which tube 40 fits precisely as shown by FIGURE 11.

In case of either form of the spout employing a tube it closely fits the size of the opening formed by the cutter to substantially prevent leakage, and any liquid that does leak out between the edges of the openings in the respective cans and the spouts will follow the exterior of the spout to its end and, therefore, be discharged in the same place as liquid flowing through the spout.

In the form of the invention illustrated in FIGURES 14 through 18, the elongated liquid guiding means 50 is provided in the form of a trough rather than a tube. This trough may be in any suitable shape and is here shown as being three sides of a rectangle in section. A cutter element 51 combined with an integral fulcrum member 52 is secured to the underside of the trough.

Cutter 51 is of such a shape that the opening it provides in the can will conform to the shape of the trough as far as the sides of the trough extend. Thus cutter 51 is provided with straight side portions 53 and 54. The outer end of cutter 51 may be pointed to allow it to make the initial fracture of can top 55 easily. As in the case of the other forms of the invention fulcrum hook 52 fulcrums about the rim 56 of can 57 in order to provide the leverage for cutter 51 to puncture can top 55 and secure the spout to the can.

At the end of the spout trough nearest the cutter but on the opposite side of the trough from the cutter are depressions 58. As shown in FIGURE 16 these depressions engage the edge of can top 55 to yieldingly secure the spout in the opening when positioned as shown in that figure. As shown in FIGURE 18, the opening in the can top made by cutter 51 when viewed from the can rim engaged by the fulcrum member is like a stylized outline of a house. Straight portions 53, 54 of cutter 51 form the straight portions 59 and 60 of the cut. It is the edges of the can top 55 at the ends of these straight portions farthest from the can rim which are engaged by depressions 58 in the trough edge in order to secure the spout in the can. Since the trough does not enclose completely the liquid directed in the liquid guiding member in this form of the invention, more care must be exercised in using this form of spout than is true with the forms employing a tubular liquid guide. Nevertheless, it is entirely practical and is included to illustrate another of the variety of forms which this spout may reasonably take.

While the tube shown in FIGURES 1–7, having the cutter formed integrally with one side of the tube and diverging therefrom with the fulcrum member separately secured to the outside of the tube, is shown as triangular in section; it is obvious that the tube could be made in any suitable shape such as rectangular, hexagonal or other polygonal configuration and the cutter 21 similarly shaped. Likewise, the cutter 21 might extend straight and the remote tube end be curved as illustrated in FIGURES 8–13. Likewise, the form of cutter shown in FIGURES 1–7 could be made as a separate piece as illustrated in FIGURES 8–13. In short, the various features of the different forms of the invention may be combined in different ways to produce a spout having the particular characteristics desired.

Since it is seen that any spout of the invention need only engage a portion of a can rim and its top, it is obvious that this spout may be used with cans of widely varying size. There is no limitation upon the use of this spout with either very large or very small cans, as it has no portion specifically adapted to fit any one size container. Furthermore, the device may obviously be made in a size that permits being carried in a pocket of a person working at a job which might require this type of spout. It thus combines portability with great versatility.

A bottle cap opener for prying off crimped on bottle caps may be secured to the tube at a point remote from the opener end if desired. Such opener may be merely a hook or the like secured to the elongated, liquid guiding member but spaced from its liquid discharge end. Such a hook would be used to engage the edge of a bottle cap to pry it off.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A spout for containers comprising: a tube, a cutter secured to one side of said tube, said cutter having a free end, a fulcrum member secured to said tube and spaced from the free end of said cutter, the plan view of said cutter being the same size and configuration as the tube cross section, said cutter diverging from the longitudinal axis of said tube, the side of said tube opposite and at the end adjacent said cutter curving toward said

cutter and the sides of said tube near said cutter slanting inward to form an opening entering portion whereby the entire end of said tube is introduced into an opening formed in a container by said cutter and the walls of said tube frictionally engage all the edges of said opening to wedge said spout in said opening.

2. The spout of claim 1 in which said cutter and said fulcrum member are integrally formed as a separate piece from said tube and secured to the outside of said tube.

3. A spout comprising: an elongated liquid guiding trough, a cutter secured to one end of said elongated liquid guiding trough, a fulcrum secured to the outside of said liquid guiding trough, and depressions formed in said liquid guiding trough on the opposite side thereof from said fulcrum, said liquid guiding trough having a cross section that is the same size and shape as a portion of said cutter adjacent to said trough viewed in plan, whereby the entire end of said trough enters an opening made by said cutter, said trough sides engage the

opening sides throughout their extension and the walls of said depressions engage corresponding edges of an opening formed by said cutter to secure said elongated liquid guiding trough in an opening made by said cutter.

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